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ROUTING AND TRANSMITTAL SLIP September 21, 2009

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ACTION MEMORANDUM

Confirmation of Verbal Authorizations for the Removal Action at the Raritan Bay Slag Site, Old Bridge Township and Sayreville Borough, Middlesex County, NJ

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Room No. Bldg. EDISON

Phone No. 6658

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 2
290 BROADWAY
NEW YORK, NY 10007-1866

ACTION MEMORANDUM RVI

DATE: NOV 25 2009

SUBJECT: Confirmation of Verbal Authorizations for the Removal Action at the Raritan Bay Slag Site, Old Bridge Township and Sayreville Borough, Middlesex County, New Jersey

FROM: Andrew L. Confortini, On-Scene Coordinator
Removal Action Branch

TO: Walter E. Mugdan, Director
Emergency and Remedial Response Division

THRU: Joseph D. Rotola, Chief
Removal Action Branch

Site ID: A205

I. PURPOSE

The purpose of this Action Memorandum is to confirm and document the verbal authorizations granted by the Director of the Emergency and Remedial Response Division, on March 18, 2009 and April 30, 2009, to initiate and continue to conduct the time-critical removal action described herein at the Raritan Bay Slag Site (Site) located in Old Bridge Township, 08857 and Sayreville Borough, 08872, Middlesex County, New Jersey (see Figure 1-Attachment A).

A copy of each verbal authorization is provided as Attachment B. Verbal authorization in the amount of $175,000 was received on March 18, 2009. A second verbal authorization in the amount of $200,000 was granted on April 30, 2009, to allow removal activities to continue.

The total project ceiling documented in this Action Memorandum is $375,000 of Direct Extramural Funds, of which $325,000 was funded from the Regional Removal Advice of Allowance. Conditions at the Site meet the criteria for a removal action under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)

of 1980, as amended by the Superfund Amendment and Reauthorization Act (SARA), and documented in Section 300.415(b)(2) of the National Contingency Plan (NCP).

On November 2, 2009, the Site was included to the National Priorities List (NPL). There are no nationally significant or precedent-setting issues associated with the response.

II. SITE CONDITIONS AND BACKGROUND

The Comprehensive Environmental Response, Compensation, and Liability Information System identitication number for the Site is NJN000206276.

A. Site Description

1. Removal Site Evaluation (RSE)

On April 24, 2008, the United States Environmental Protection Agency (EPA), Removal Action Branch received a request from the New Jersey Department of Environmental Protection (NJDEP) to evaluate the Laurence Harbor Seawall for a removal action under CERCLA. On November 3, 2008, NJDEP forwarded an amended request to include the westem jetty along the Cheesequake Creek Inlet to the overall Site. A copy of each NJDEP referral letter is provided as Attachment C. In March 2009, the 47-acre property associated with Margaret's Creek was also included to the overall site through a request made to the Remedial Program. The complete RSE is provided as Attachment D.

As presented in the RSE, elevated levels of lead, antimony, arsenic and copper were identified by the NJDEP in the soil and sediment along the seawall and the Margaret's Creek area. One area of concern identified during the sampling was at the edge of the beach near the westem end of the seawall. As a temporary measure, this area was fenced and posted with "Keep Off" signs by Old Bridge Township. In addhion, the Township notified the residents of Laurence Harbor of the situation. During an environmental assessment of the Margaret's Creek area by NJDEP, slag and battery casings were observed at numerous surface locations on the Site. NJDEP, while overseeing the installation of a replacement sanitary sewer line through the Margaret's Creek property, many more battery casings were encountered and subsequently mitigated by NJDEP.

As part of EPA's integrated assessment of the property, samples were collected within and along the Old Bridge Waterfront Park seawall and from the westem jetty in Sayreville during September 2008 and April 2009. The sampling included the collection of soil, sediment, water, biological organisms and actual waste or jetty material.

Analytical results obtained by both EPA and NJDEP indicate that elevated levels of lead and other heavy metals are present in the soils, sediments and surface water in and around both the seawall in Old Bridge and the westem jetty along the Cheesequake Creek Inlet in Sayreville. Analytical results for surface samples collected near the seawall were as high as: 142,000 parts per million (ppm) for lead, 12,900 ppm for antimony, 3,350 ppm for arsenic and 3,590 ppm for copper. Four surface soil samples collected from the

western jetty along the Cheesequake Creek Inlet contained lead concentrations which ranged from 54,800 ppm to 198,000 ppm. The maximum concentrations of antimony, arsenic and copper were 3,120 ppm, 2,470 ppm and 4,630 ppm, respectively. Nine of 13 soil samples collected in and around the Old Bridge seawall and the western jetty exceed the Resource Conservation and Recovery Act (RCRA) Toxicity Characteristic Leaching Procedure (TCLP) limit for lead (5 ppm). The TCLP results for the soil from the western jetty exceed the limit approximately 100 to 250 times.

2. Physical location

The Site is located north of Route 35 in the Laurence Harbor section of Old Bridge Township and in the Borough of Sayreville along the Raritan Bay in Middlesex County, New Jersey (see Figure 1, Attachment A). The Site consists of the Laurence Harbor seawall and the estimated 47 acres of wetland areas associated with Margaret's Creek, located in Old Bridge Township; and the western jetty extending from the Cheesequake Creek Inlet into Raritan Bay, located in the Borough of Sayreville (see Figure 2, Attachment A).

The Laurence Harbor seawall is adjacent to a portion of Old Bridge Waterfront Park. The park is made up of paved pathways, grassed areas, benches, a gazebo, a playground area, several public beaches connected by a boardwalk, and three jetties (not including the two jetties at the Cheesequake Creek Inlet). The park waterfront, approximately between the playground and the gazebo, is protected by a seawall partially constmcted with pieces of slag. Slag was deposited along the beachfront in the late 1960's and early 1970's to form a seawall that spans approximately 2,500 feet.

The paved and grassed portion of the park is situated between Bayview Drive, the northernmost roadway within this portion of Laurence Harbor, and the seawall. A residential neighborhood lies between Bayview Drive and Route 35. Topographically, Bayview Drive is situated at a higher elevation than the park, which in turn blends into the seawall as it slopes towards Raritan Bay. The distance between Bayview Drive and the seawall is approximately 250 feet.

The park is a popular recreational area and serves as a link between the Laurence Harbor beaches and the Cliffwood Beach waterfront. A boardwalk that mns from the western end of Laurence Harbor, parallel to Shoreland Circle, ends just north of a parking area at the end of Laurence Harbor Parkway and then continues again briefly at the eastern end of the park as it crosses over Margaret's Creek. The beaches situated just west of the seawall and east of the eastern jetty of the Cheesequake Creek Inlet appear to be the most frequented for bathing due to their proximity to parking areas. There are three jetties with concrete pads in Laurence Harbor north of Shoreland Circle. Due to accessibility, the one closest to the seawall is the most popular for fishing. Persons have also been observed using the seawall and the area where Margaret's Creek flows into Raritan Bay to fish and catch other marine life, but to a lesser extent.

The westem jetty at the Cheesequake Creek Inlet, and the adjoining waterfront area west of the jetty, contains slag as well. The jetty, which is approximately 800 feet in length and is situated near the Morgan Drawbridge, was covered with slag at approximately the same general time period as the seawall was in Laurence Harbor. It is situated on a relatively isolated piece of land bound by Raritan Bay to the north, the Cheesequake Creek inlet to the east, Route 35 to the south, and railroad line to the west. The jetty is part of a property that formerly housed the Robert E. Lee Restaurant in the 1980's. The closest residence to this portion of the Site is approximately 900 feet away on the opposite side of Route 35. The eastem jetty along the Cheesequake Creek Inlet is located in Laurence Harbor. The Cheesequake Creek inlet is a popular location for fishing and crabbing. Persons use both of the jetties for these purposes, as well as the beach on the eastem side of the inlet, which is in Laurence Harbor. The deep channel inlet, which is 100 feet wide and generally five to six feet deep at its lowest point during Mean Low Water, serves as a passageway for boats kept in marinas on Cheesequake Creek, a predominantly recreational waterway used by small vessels. Cheesequake Creek is a tidal estuary that comects Raritan Bay to an inland marsh located generally between Route 9 and the bay.

Raritan Bay is a tidal water body that receives flow from the Raritan River and the Arthur Kill. Tides in the bay can vary by six feet at times. Due to the relatively shallow nature of the bay, a significant amount of tidal flats are exposed at low tides. Raritan Bay is considered a fishery and supports populations of striped bass, fluke, flounder, bluefish, tautog, and weakfish. The cmstacean species include the blue claw crab, fiddler crab, green crab, and spider crab. A variety of clams, mussels, and oyster are also present in the bay. Horseshoe crabs, whose spawning habitats provide an important food source for migrating shorebirds, are present along the shorelines of Raritan Bay. Shorebird surveys have indicated the importance of Raritan Bay for spring and fall shorebird migration. Three species, sanderling, mddy tumstone and semi-palmated sandpiper make up the majority of migratory shorebirds using Raritan Bay. Herons, osprey, egrets, and ibis have been documented to use the westem portion of the bay for foraging.

Essential fish habitat (EFH) designations have been compiled and assigned by the National Oceanic and Atmospheric Administration's (NOAA) National Marine Fisheries Service for a variety of species in Raritan Bay. Fourteen species that have been identified in the Laurence Harbor area include: Atlantic butterfish, black sea bass, bluefish, cobia, Atlantic herring, king mackerel, Atlantic mackerel, red hake, scup, Spanish mackerel, summer flounder, windowpane, winter flounder, and dusky shark.

3. Site characteristics

Historical records indicate that in September 1972, the NJDEP was advised by a local environmental commission member that lead-bearing waste material was being disposed of along the Laurence Harbor beachfront. The material was reported to be non-recoverable, low-yield metallic waste from a blast fumace and blast fumace rubble. The slag was deposited at the beachfront in the late 1960's and early 1970's, mostly in the form of blast furnace pot bottoms, in an area that had sustained significant beach erosion

and damage due to a series of storms in the 1960's. Demolition debris in the form of concrete and a variety of bricks, including fire bricks, was also placed along the beachfront. A portion of the seawall also contains large riprap believed to have been placed over the slag at the time the grassed and paved portion of the park was developed. It is reported that the slag extends to beneath the developed portion of the park.

The western jetty at the Cheesequake Creek has been in existence since the U.S. Army Corps of Engineers constmcted it in the late nineteenth century. The slag was reportedly placed on the jetty during the same general time period as when the seawall was created. The entire jetty is covered with slag that is similar in appearance to that which is present on the seawall. Cmshed battery casings are also evident on portions of the jetty, especially towards the southem end. Demolition debris in the form of concrete is also present, but to a lesser extent than at the seawall.

Most of the slag at the Site consists of various-sized, semi-spherical shaped objects. At the jetty, aside from the pot bottoms, there is also some evidence of an amorphous slag within which there is rock, crushed battery casings, and different forms of metal. In some locations on the jetty, especially closer to the southem end, the slag has been eroded and/or abraded into smaller pieces and finer dust. Evidence of pieces of the cmshed battery casings is present, from east to west, along the first and second beach from the western end of the seawall, along the westem edge of the westernmost beach in Laurence Harbor adjacent to the Cheesquake Creek Inlet, and to a lesser extent along the seawall. Most of the cmshed battery casings are evident near or below the high tide marks on the beaches.

The Margaret's Creek Site, located between Laurence Harbor and Cliffwood Beach just southeast of the Site, is an area where the NJDEP had previously discovered lead-contaminated waste, including crushed battery casings. The NJDEP was the lead agency with respect to the investigation of the Margaret's Creek Site until recently, when it was referred to EPA for inclusion within the Raritan Bay Slag Site. It consists of an estimated 47-acre wetland area that is associated with the creek.

The Old Bridge Waterfront Park and the 47 acre Margaret's Creek portion are owned by Old Bridge Township. The land adjacent to the westem jetty at the Cheesequake Creek inlet has been vacant since a fire destroyed the restaurant that was there in the 1980's. The jetty and the adjoining waterfront area are privately owned. A portion of the waterfront west of the jetty is owned by the Borough of Sayreville.

4. Release or threatened release into the environment of a hazardous substance, or pollutant, or contaminant

Sampling conducted at the Site has documented the actual release of hazardous substances into the environment. The metal constituents primarily evident in the slag, as evidenced by the analysis of the material itself are: lead, arsenic, copper, antimony, and iron. Tin, zinc, silver, and nickel have been identlfied to a lesser extent.

The NJDEP collected surface soil samples over two sampling events between May and July 2007. Results from the first sampling event identified elevated levels of lead, antimony, arsenic, and copper in soils associated with the seawall. Amongst these samples, the maximum concentration detected were; lead (142,000 milligrams per kilogram (mg/kg)), antimony (12,900 mg/kg), arsenic (3,350 mg/kg), and copper (3,590 mg/kg). The second sampling event focused on the collection of samples within the park adjacent to the seawall where potential exposure to persons that use the walkway would most likely occur. Thirty-one samples were collected in the park, including a section of beach east of the foot bridge over Margaret's Creek. Two areas of potential concern were identified; one just south of the footbridge over Margaret's Creek and another on the beach between the western edge of the seawall and the first jetty. The former is actually within a portion of the seawall that wraps around the eastern edge of the park, west of Margaret's Creek. Elevated levels of lead (25,600 mg/kg) and other heavy metals were identified in this area that is isolated by a split-rail fence and contains exposed slag. The latter area consisted of two samples where lead was identified at 1,090 mg/kg (with a duplicate result of 647 mg/kg) and 545 mg/kg. The higher concentration was detected in an area of the beach directly adjacent to the western edge of the seawall.

The analytical results from the samples collected by EPA during the period of September 10 through September 16, 2008 indicated the presence of elevated levels of lead and other heavy metals in a variety of media. Four surface soil samples collected on the western jetty of the Cheesequake Creek Inlet ranged in lead concentration from 54,800 mg/kg to 198,000 mg/kg. These soil samples likely contained material from eroded slag since they were collected near slag that appeared to have been eroded and/or abraded. The maximum concentrations of antimony, arsenic, and copper detected on the western jetty were 3,120 mg/kg, 2,470 mg/kg, and 4,630 mg/kg, respectively. A soil sample collected west of the western jetty contained a lead concentration of 14,200 mg/kg. Sediment samples collected west of the western jetty contained lead concentrations as high as 2,150 mg/kg. Both sediment samples collected from the Cheesequake Inlet, close to the western jetty, which were identified to contain 42,200 mg/kg and 89,200 mg/kg of lead, were subsequently rejected as unusable during the data validation due to quality control issues pertaining to a low recovery on the matrix spike sample. The estimated maximum concentrations detected for antimony, arsenic, and copper at these two locations were 3,270 mg/kg, 2,100 mg/kg, and 2,050 mg/kg, respectively. The surface water west of the western jetty contained a maximum total lead concentration of 1,810 micrograms per liter (µg/l). Antimony, arsenic, and copper were detected at maximum total lead concentrations of 53.2 µg/l, 70.9 pg/l, and 154 µg/l, respectively, west of the western jetty. Surface water samples collected from the Cheesequake Creek Inlet contained a maximum total lead concentration of 6.7 pg/l. The dissolved metals results for these samples, as well as those taken throughout the Site, were relatively similar to the total concentrations.

Surface soil samples collected from the beach area along the seawall contained estimated lead concentrations as high as 1,600 mg/kg. A surface soil sample collected from the portion of the seawall that wraps around the eastern end of the park near

Margaret's Creek, south of the footbridge, contained an estimated lead concentration of 10,200 mg/kg. Sediment samples collected along the seawall contained a maximum concentration of 5,860 mg/kg. The maximum total lead concentration of surface water samples collected near the seawall was 153 pg/l. A surface water sample collected from a wetland area near the portion of the seawall that wraps around the eastem end of the park near Margaret's Creek contained a maximum total lead concentration of 298 µg/l. Water samples collected from Margaret's Creek near the seawall contained a maximum total lead concentration of 49.9 µg/l.

Nine of 13 soil samples collected in and around the seawall and the westem jetty at the Cheesequake Creek Inlet exceeded the Resource Conservation and Recovery Act (RCRA) TCLP limit for lead (5 milligrams per liter (mg/l)). The TCLP results for the soil from the westem jetty exceeded the limit by a magnitude of approximately 100 to 250 times.

Elevated levels of lead were also identified at several surface locations on the beach between the westem end of the seawall and the first jetty in Old Bridge Waterfront Park. The average lead concentration of the four highest detections at this location was 1,365 mg/kg, with a maximum lead concentration of 1,630 mg/kg. Subsurface samples collected from a location near the westem edge of the seawall at depths of six to twelve inches and twelve to 18 inches were found to contain estimated lead concentrations of 18,400 mg/kg and 23,800 mg/kg, respectively. Sediment samples from this area indicated the presence of lead in concentrations ranging from 200 to 533 mg/kg. Three activity-based water samples collected from the beach area situated between the westem end of the seawall and the first jetty had an average total lead concentration of 1,179 µg/l, with a maximum lead concentration of 1,450 pg/l.

Surface soil samples collected from the beach area between the first and second jetty indicated the presence of estimated lead concentrations ranging from 109 mg/kg to 935 mg/kg. Surface soil samples collected from the beach area between the third jetty and the eastem jetty of the Cheesequake Creek Inlet indicated the presence of lead at concentrations ranging as high as 94.1 mg/kg. Sediment samples from this area contained a maximum lead concentration of 11.4 mg/kg. Surface soil samples collected from the beach area, parallel to the inlet on the eastem side of the Cheesequake Creek Inlet, contained a maximum lead concentration of 4.4 mg/kg. Activity-based surface water samples collected from the beach area contained a maximum total lead concentration of 99 µg/l.

Twenty-four surface soil samples collected from throughout the park and playground area contained a maximum estimated lead concentration of 97.8 mg/kg. Arsenic was detected at 144 mg/kg at one location at the playground.

The analytical results from the slag samples collected in September 2008 by ERT revealed elevated concentrations of arsenic, copper, lead, antimony, tin, and zinc.

Lead concentrations exceeded 10,000 mg/kg for 15 of the 17 samples analyzed and 100,000 mg/kg for five of the 17 samples analyzed. The maximum concentrations detected for some of the other metals were: arsenic (15,200 mg/kg), copper (445,000 mg/kg), antimony (71,300 mg/kg), tin (11,400 mg/kg), and zinc (13,400 mg/kg). Metal speciation analysis of the slag identified various lead, copper, arsenic, and tin compounds as dominant species. Five different lead species were identified as dominant species in the slag. The interior and exterior layers of the slag contained different lead species, with the interior layers containing species with greater affinity to mobilize from the potential weathering and erosion of the slag. All 17 slag samples exceeded the RCRA regulatory limit for lead, designating the slag as hazardous waste. The highest TCLP result identified exceeded the limit by over 600 times. Particularly high levels of lead were determined to be leachable from neutral salt solutions with higher levels of leachable lead in the interior (non-weathered) samples compared with the exterior layer of the slag.

Soil and pore water collected along the inter-tidal zone adjacent to the seawall had high metal concentrations consistent with the release of metals from the slag. High concentrations of lead (2,400 µg/l), arsenic (230 µg/l), and antimony (270 µg/l) were measured in the unfiltered samples. In addition, high concentrations of dissolved lead (170 pg/l), arsenic (86 pg/l), and antimony (130 µg/l) were measured for several of the filtered samples.

The organisms collected from the inter-tidal zone included two mollusks (ribbed mussels and long neck or steamer clams), macro-algae, and foraging fish (killifish). In addition, hard shell clams were collected in the sub-tidal zone. The macro-algae had the highest metal accumulations for lead (80 mg/kg) and arsenic (15 mg/kg). Of the three mollusks, the juvenile clams accumulated the highest concentrations of lead (17 mg/kg) and copper (31 mg/kg).

The analytical results from the samples collected by EPA during April 2009 indicated the presence of elevated levels of lead at several surface locations (0 to 2 inches), albeit at levels lower than those found during the September 2008 sampling event. The highest concentrations detected in the soil, sediment and water were from the beach area between the first jetty and the second jetty. The maximum lead concentration detected in the soil was 771 mg/kg. The average lead concentration of the 14 grid-based soil sample locations from this area was 264 mg/kg. The highest lead concentration detected in the sediment samples was 1,090 mg/kg. The average concentration of the 14 sediment sample locations was 355 mg/kg. The highest lead concentration detected in the surface water samples was 767 µg/l and it was from an activity-based sample. All of the activity-based surface water samples throughout the Site contained higher concentrations of lead than the undisturbed surface water samples from the same area. The dissolved metals results for these samples, as well as those taken throughout the Site during the April 2009 event, were mostly all non-detect for lead.

Surface soil samples collected from 34 grid-based locations on the beach area between the second jetty and third jetty contained a maximum lead concentration of 199 mg/kg, with an average concentration of 37 mg/kg. Sediment samples collected from 22 locations in this area contained an estimated maximum lead concentration of 87.4 mg/kg, with an estimated average concentration of 37 mg/kg. The highest lead concentration detected in an activity-based surface water sample from this area was 519 pg/l.

Surface soil samples collected from ten grid-based locations on the beach area between the third jetty and the eastem jetty at the Cheesequake Inlet contained an average lead concentration of less than 10 mg/kg. Sediment samples collected from 29 locations in this area also contained an average concentration of less than 10 mg/kg. These sample locations spanned the central to eastem portion of this area where samples were not collected during the previous sample event in 2008. The highest lead concentration detected in an activity-based surface water sample from this area was 209 µg/l.

Surface soil samples collected from 36 grid-based locations on the beach area between the eastem side of Margaret's Creek and the MCUA pumping station contained an estimated average lead concentration of less than 5 mg/kg. Sediment samples collected from 36 locations in this area contained an average lead concentration of less than 10 mg/kg. The highest lead concentration detected in an activity-based surface water sample from this area was 37 µg/l.

Six background sediment samples collected east of the MCUA pumping station contained an average estimated lead concentration of less than 5 mg/kg.

All of the materials listed above, except for tin, are CERCLA-designated hazardous substances, as listed in 40 CFR Table 302.4. The analytical data presented above is a summary of the most significant data available from the aforementioned reports. It is not meant to be inclusive of all of the analytes detected at the Site.

The mechanism for past releases to the enyironment appears to have been the placement of slag onto the waterfront along the Raritan Bay and the subsequent impact from the material being in direct contact with the water body. The slag has been present in a salt water environment for approximately 40 years resulting in deterioration of its surface. The release of the slag constituents into the marine environment is as a result of leaching and/or weathering caused by tidal fluctuations and wind. These constituents are being biologically accumulated. The accumulation of contaminants in biota not residing immediately adjacent to the slag material, reveal that the contaminants are being transported away from the source material.

The release into the Raritan Bay and the immediate surroundings of the Site will continue as long as the slag remains in its current state in this environment; providing an ever present loading of heavy metals at levels significantiy above the background levels of an already impacted water body. The movement of the water in the bay will provide the main contaminant transport mechanism from the source, or from already contaminated

areas, to adjoining areas within the bay. Persons using the areas in the vicinity of the slag could potentially be exposed to elevated levels of lead and other heavy metals.

5. NPL status

The Site was listed on the NPL on November 2, 2009.

6. Maps, pictures and other graphic representations

Figures 1 through 3 are provided as Attachment A and provide the general location and layout of the Site as well as sampling locations. Attachment E includes photographic documentation of conditions at the Site.

B. Other Actions to Date

1. Previous actions

There has been no previous Federal or private response actions undertaken at the Site in the past.

2. Current actions

A fund-lead CERCLA removal action to minimize access and direct contact to the hazardous substances at the Site started on Aprll 2, 2009 and was completed in September 2009. The removal action consisted of installing a chain-link security fence and waming signs to llmit access to surface material containing heavy metals which pose a threat to public health through direct contact. Areas that were secured and posted with waming signs include the Old Bridge seawall, westem jetty and Route 35 access to Margaret's Creek.

The actions to date have been funded through verbal authorizations which were obtained from the Deputy Division Director on March 18, 2009 and April 30, 2009. The March 18, 2009 verbal authorization was in the amount of $175,000 and the April 30, 2009 verbal authorization was in the amount of $200,000. Total funding authorizations approved for the action was $375,000.

C. State and Local Authorities Role

1. State and local actions to date

On April 24, 2008, the EPA, Removal Action Branch received a request from the NJDEP to evaluate the Laurence Harbor Seawall for a removal action under CERCLA. On November 3, 2008, NJDEP forwarded an amended request to include the westem jetty along the Cheesequake Creek Inlet to the overall Site. In March 2009, the request was amended to include the Margaret's Creek area to the overall Site.

Based on the analytical results of the soil samples collected by the NJDEP at the Laurence Harbor seawall, the New Jersey Department of Health and Senior Services (NJDHSS) provided a health consultation. As a result of the health consultation, the Township of Old Bridge erected a temporary "snow" fence near the western edge of the seawall. Warning signs for people to stay off the seawall were posted along a split-rail fence that previously ran the entire length of the seawall (note: the split-rail fencing has been replaced by a chain-link fence). A letter was sent to all of the residents of Laurence Harbor informing them of the analytical results, the sign postings, and offering blood lead testing. The temporary fencing, while providing a visual demarcation, was not effective since persons walked around it, and access was available to the seawall, especially during low tide. The signs did not warn of the problem associated with the contamination at the seawall and the split-rail fence did not in any way prevent people from accessing the area.

2. Potential for continued State/local response

At this time it is not known whether there will be any future State or local actions taken at the Site.

III. THREATS TO PUBLIC HEALTH, OR WELFARE, OR THE ENVIRONMENT, AND STATUTORY AND REGULATORY AUTHORITIES

Conditions at the Site meet the requirements of 40 CFR §300.415(b)(2) of the NCP for the undertaking of a CERCLA removal action. Factors from the NCP that support a removal action at this Site are provided below.

A. Threats to Public Health or Welfare

(i) Actual or potential exposure to hazardous substances, or pollutants, or contaminants by nearby populations, or the food chain (40 CFR §300.415(b)(2)(i);

Persons, including children, are coming into direct contact with the slag and the area around the slag that has been impacted by the release of hazardous substances. The slag has deteriorated over time resulting in a release of elevated levels of hazardous substances onto the adjoining beach and tidal flats of the Raritan Bay. Limited security measures previously taken at the Laurence Harbor seawall have not prevented access to the impacted area. Persons have been observed fishing from both the seawall and the western jetty at the Cheesequake Inlet, collecting clams and mussels near the seawall, and catching crabs in and around the Cheesequake Creek Inlet. Persons have also been observed eating while present at both of the slag areas, increasing the potential for ingestion of the hazardous substances. Based on the analytical results of samples collected from clams, mussels, and small fish in the area of the Site, elevated levels of hazardous substances have been detected in the food chain. These substances could potentially impact larger fish that use the bay and have the potential to be consumed by persons fishing in the area of the Site. Discussions with persons fishing in the area have

revealed that there are persons that consume their catch, including fish, crabs, and soft shell clams.

In 2007, samples collected by the NJDEP from the adjoining beach and the park were evaluated by the NJDHSS. It was concluded, based on an elevated detection of lead on the edge of the beach near the western end of the seawall, that children (aged six to 84 months) who visit the beach more than three days per week over a three month period would be at risk of having elevated blood levels higher than the recommended protection level. Based on these findings, it was recommended that access to this area be restricted via use of temporary fencing, while additional delineation of contamination was planned, and warning signs be posted along the seawall to prevent access to this area.

The NJDHSS, under a cooperative grant with ATSDR, evaluated the analytical data generated by EPA during the September 2008 sampling event. It was concluded, as documented in "Evaluation of Environmental Data, Raritan Bay Slag" prepared by NJDHSS, February 2009 (see Attachment F), that the seawall and the beach between the western edge of the seawall and the first jetty represent a Public Health Hazard based on lead exposures to children. The western jetty at the Cheesequake Creek Inlet represents a Public Health Hazard based on potential health effects associated with elevated levels of lead, antimony, and arsenic.

(iv) High levels of hazardous substances, or pollutants, or contaminants in soils, largely at or near the surface, may migrate (40 CFR §300.415(b)(2)(iv)); and

Elevated levels of lead, antimony, arsenic, and copper have been identified in slag that is present on the banks of the Raritan Bay. The slag and the impacted soils and sediment are present in a marine environment that is subject to changing tides and weather conditions. At high tide, a significant portion of the slag is submerged. In the area of the western jetty at the Cheesequake Creek Inlet, some of the slag remains submerged even during low tide periods. As a result of contaminant migration, the soil and sediment in around the slag, and even beyond the immediate area of the slag, has been contaminated by these heavy metals. This contamination is susceptible to migration into other parts of the Raritan Bay and potentially could continue to increase the overall loading of these heavy metals beyond the immediate area of the slag. The slag deposits and the areas around them are frequented by persons for fishing, crabbing, clamming, and other recreational uses and are easily accessible.

(v) Weather conditions exist that may cause hazardous substances to migrate or be released (40 CFR §300.415(b)(2)(v)).

The slag deposits are exposed to nature and, under normal conditions, are impacted by being in contact with salt water and wind. The slag is further susceptible to ongoing erosion, scouring, and leaching from exposure to heavy winds, tidal action, salt water, and abrasive sand and gravel. These weather conditions increase the potential for a physical release of particles and/or a chemical leaching of the slag. A heavy surf, caused by strong winds, can stir up the sand and gravel and erode the slag. It can also provide a

transport mechanism for the existing contaminated sediments to become entrained into the water column and migrate further from the seawall and the jetty.

B. Threats to the Environment

(i) There is an actual or potential exposure to nearby animals or the food chain from hazardous substances, pollutants or contaminants (40 CFR §300.415(b)(2)(i));

The Raritan Bay is considered a fishery. Striped bass, fluke, flounder, bluefish, tautog, and weakfish are present in the bay. Blue claw crabs, fiddler crabs, green crabs, spider crabs, clams, mussels, and oyster are also present in the bay, some of which are trapped and/or extricated in and around the Site. An EFH designation has been assigned by NOAA for a variety of species in Raritan Bay. CERCLA hazardous substances have been identified as having migrated from the Site. These hazardous substances have also been detected in samples collected of clams, mussels, and foraging fish. These substances could potentially impact larger fish and birds that use the bay. Numerous birds can be seen flying and eating near the shoreline at the Site. These birds would be expected to be consuming small fish, clams, worms, and other species, that can be found in the immediate shoreline adjacent to the slag deposits.

(iv) High levels of hazardous substances or pollutants or contaminants in soils, largely at or near the surface, may migrate (40 CFR §300.415(b)(2)(iv)); and

Elevated levels of heavy metals have been identified along the shoreline of the Raritan Bay at the Site and in its sediments. The location of this contamination in a tidal, salt water setting makes it susceptible for further migration. Most of the seawall and the western jetty are submerged during normal high tides. These potential releases could impact the fish and wildlife in the area of the Site.

(v) Weather conditions that may cause hazardous substances, or pollutants, or contaminants to migrate or be released (40 CFR §300.415(b)(2)(v)).

Rainfall and flood events increase the likelihood that the heavy metals will migrate from the slag into the Raritan Bay. During periods of elevated flow and windy weather, the turbulence of the waters in the bay increase and further scour the slag and the immediate shoreline potentially introducing an increased amount of contaminants into the water column. This release could potentially impact the fish and wildlife in the area of the Site.

IV. ENDANGERMENT DETERMINATION

Actual or threatened releases of hazardous substances at or from the Site, if not addressed by implementing the response action selected in this Action Memorandum, may present an imminent and substantial endangerment to public health, or welfare, or the environment.

V. PROPOSED ACTIONS AND ESTIMATED COSTS

A. Proposed Actions

1. Proposed action description

Based upon the validated results obtained from the initial phase of sampling and health consultations by NJDHSS, the Site was determined to be eligible for a removal action. Verbal authorizations totaling $375,000 were approved by the Deputy Division Director to conduct the removal action.

Due to the many possible exposure pathways, overall size and complexity of the Site, the action selected was limiting access to the affected beach and slag material (western jetty and seawall). The actions taken and completed include the installation of chain-link fencing along the Old Bridge Waterfront Park seawall, along the portion of Route 35 at the Margaret's Creek area and at the entrance to the western jetty. In addition, warning signs identifying the contaminants and explaining the potential threat were installed, as well as NJDEP fish advisory signs.

2. Contribution to remedial performance

The removal action will not impact any plans for the long-term remediation of metals contaminated soils and sediment.

3. Description of alternative technologies

Alternative technologies were not considered. Installing a chain link fence along the seawall and jetty to minimize direct contact with contaminants in surface soil and slag is the most cost effective and expedient measure to address the immediate public health concerns at the Site.

4. EE/CA

Due to the time-critical nature of this removal action, an EE/CA will not be prepared.

5. Applicable or relevant and appropriate requirements (ARARs)

ARARs that are within the scope of this removal action were met to the extent practicable, considering the exigency. Federal ARARs applicable for the work proposed and completed include the Occupational Safety and Health Act.

6. Project schedule

The posting of warning signs and installation of security fencing along the jetty and seawall were completed in September 2009.

B. Estimated Costs

A summary of estimated costs for the action is presented below and provided in detail in the Confidential Attachment (see Attachment G).

EXTRAMURAL COSTS:

	Verbal Authorization Ceiling Amount Granted on March 18, 2009	Verbal Authorization Ceiling Amount Granted on April 30, 2009	Ceiling Increase Requested in this Action Memorandum	Proposed New Total Project Ceiling
Total Cleanup Contractor Cost (Includes 20% Contingency)	$150,000	$175,000	$0	$325,000
Other Extramural Costs	$25,000	$25,000	$0	$50,000
Subtotal, Extramural Costs	$175,000	$200,000	$0	$375,000
Extramural Cost Contingency	$0	$0	$0	$0
Total, Extramural Removal Action Project Ceiling	$175,000	$200,000	$0	$375,000

VI. EXPECTED CHANGES IN THE SITUATION SHOULD ACTION BE DELAYED OR NOT TAKEN

The actions taken have served to minimize the threats to public health through direct contact to hazardous substances and to notify and educate the public on exposure to heavy metal contaminated areas. The actions taken are an interim measure and do not address the remediation of the slag material which contain high concentrations of heavy metals.

VII. OUTSTANDING POLICY ISSUES

None.

VIII. ENFORCEMENT

EPA is conducting a search for potentially responsible parties (PRPs) for the Site. At this time, no PRPs have been noticed.

Enforcement Cost Estimate

Based on full-cost accounting practices, the total EPA costs for this removal action that will be eligible for cost recovery are estimated to be $572,645. The cost breakdown is as follows:

EPA's Total Estimated Project-Related Costs

Cost Category	Amount
Direct Extramural Cost (rounded)	$375,000
Direct Intramural Cost	$50,000
Subtotal Direct Costs	$425,000
Indirect Costs (Indirect Regional Cost Rate 34.74%)	$147,645
Estimated EPA Costs Eligible for Cost Recovery	$572,645

Note: Direct Costs include direct extramural costs and direct intramural costs. Indirect costs are calculated based on an estimated indirect cost rate expressed as a percentage of site-specific direct costs, consistent with the full cost accounting methodology effective October 2, 2000. These estimates do not include pre-judgment interest, do not take into account other enforcement costs, including Department of Justice costs, and may be adjusted during the course of a removal action. The estimates are for illustrative purposes only and their use is not intended to create any rights for responsible parties. Neither the lack of a total cost estimate nor deviation of actual total costs from this estimate will affect the United States' right to cost recovery.

IX. RECOMMENDATIONS

This decision document represents the selected removal action for the Raritan Bay Slag Site in Old Bridge and Sayreville, Middlesex, Camden County, New Jersey and has been developed in accordance with CERCLA, as amended, and is not inconsistent with the NCP. This decision is based on the Administrative Record for the Site.

Conditions at the Site meet the NCP Section 300.415(b)(2) criteria for a removal action. I recommend your approval of this action memorandum. The total funding requested in this confirmation of verbal authorization for a removal action is $375,000, of which $325,000 is from the Regional Removal Advice of Allowance for mitigation contracting.

Please indicate your authorization of the removal action at the Raritan Bay Slag Superfund Site, as per current Delegation of Authority, by signing below.

APPROVE: _____ DATE: 11/25/09
Walter E. Mugdan, Director
Emergency and Remedial Response Division

DISAPPROVE: _____ DATE: _____
Walter E. Mugdan, Director
Emergency Remedial and Response Division

cc: (after approval is obtained)
W. Mugdan, ERRD-D
J. LaPadula, ERRD-DD
J. Rotola, ERRD-RAB
D. Harkay, ERRD-RAB
M. Pane, ERRD-RAB
B. Grealish, ERRD-RAB
C. Peterson, ERRD-NJRB
R. Basso, ERRD
D. Karlen, ORC-NJSFB
P. Brandt, PAD
R. Manna, OPM-FMB
T. Grier, 5202G
P. McKechnie, OIG
I. Kropp, NJDEP
A. Raddant, USDOI
L. Rosman, NOAA
K. Kelly, RST